

to appear in the trap early and specimens to be smaller than usual. The drought might have become serious if the coming of rain in August had been postponed for another week or two. It will certainly be a long time before the summer of 1968 is forgotten in the Hebrides.

## Georgian Bay, Lake Huron, Canada July-August 1967: August-September 1968

By A. G. M. BATTEN, F.R.E.S., and Mrs A. M. BATTEN

Most of our entomological excursions are, of necessity, to places in the Sterling area—Jamaica twice, Malaysia twice, India once, Hong Kong once and, previously, on the occasion of business visits, South Africa twice. However, since our son lives in Canada and we have grandchildren there we do visit that dollar country each year. For many years these visits have been at Christmas time, but, since retirement, we have felt that the summer months permit of rather more activity so, for the last two years we have made our visits in July and August. The exact periods of these two visits were from the 16th July until 23rd August 1967 and from 8th August until 12th September 1968.

Our son lives in Willowdale, a suburb of Toronto, some 15 miles to the north of the city. Cities are not usually satisfactory collecting grounds but in this suburb there exist what our Canadian friends call 'ravines'. These are the watercourses of small streams. Often the land around them is so uneven, of low level and so irregular that they are not disturbed but are allowed to grow wild. Except for the local children who delight in them and the use of an occasional footpath, few people visit them. They tend to abound with rough grasses and golden rod (a weed in Canada and universally abhorred) other wild plants, including milkweed, small shrubs and, sometimes, trees. The insect population of these ravines must be considerable although, as yet, we ourselves have not been very successful in collecting there.

Our son has a cottage at, or rather near, Honey Harbour in Georgian Bay a little more than 100 miles north of Toronto. Georgian Bay comprises the south-eastern part of Lake Huron. The Bay was until recently said to have some 30,000 islands many of which are small and uninhabited. This number has recently been increased to 50,000 by the inclusion, as islands, of all the pieces of rock which, from time to time, project above the water. The cottage is situated on the shore line about 5 miles north of Honey Harbour—a well known centre for boating in the summer and ice yachting in the winter. There are no roads or shops nearer than 5 miles to the cottage. Access is only by water. Power is, however, supplied by the "Hydro". The country is rocky, none of it can be called flat and north of Honey Harbour cultivation is quite impossible on the lake shores which are, for the most part, clad only by conifers, scrub oaks and juniper with an occasional maple. There is a little grass among the vast rocks but there are many small plants among the prevailing conifers. Small patches of milkweed are sometimes to be seen.

The altitude is that of the Great Lakes generally, just under 600 feet above sea level. The Lakes have to be seen for it to be realised how vast they are. They give the appearance as of the sea and the wind generally produces waves although there are no tides. Huron is 200 miles in length

and 101 miles in width with over 23,000 square miles of water. (The whole of England and Wales comprises 58,000 square miles). Georgian Bay is a relatively small area practically undeveloped for the most part except for one or two ports not in our immediate area. Apart from the many summer homes to be found on the coasts and islands there is no industry to be seen to the north of Honey Harbour.

While it is very cold in winter—the Bay itself freezes over completely, although the whole of the Lake does not,—summer temperatures can be high—well into the 80's or even 90's. Windstorms and thunderstorms are by no means unusual in the course of which the water level of the lake can, in a few hours, rise by as much as 5 feet.

From this description it may be concluded that this should be an admirable collecting area and the Royal Ontario Museum confirmed that this was so. Nevertheless, on the two occasions during which we spent a total seven weeks at the cottage we have been surprised at the very small numbers of butterflies we have seen in the months of July, August and early September. Curiously, too, we saw hardly any even in the lush country on the approaches to Georgian Bay, an area little affected by insecticides. It is no exaggeration to say that the number of butterflies seen in the Honey Harbour area on both visits did not average more than one per day—and most of the days were sunny and usually without wind.

In 1967 we saw only two Monarchs (*Danaus plexippus* Linnaeus) one Viceroy (*Limentis archippus* Cramer) the mimic of *plexippus*; half a dozen Mourning Cloaks (*Nymphalis antiopa* Linnaeus)—one of the commonest of the eastern Canadian butterflies—and five Great Spangled Fritillaries (*Speyeria cybele* Fabricius). We saw none of the Blues nor did we see more than one or two of the Hesperids and these we could not reach because of the rocky terrain. This year we certainly saw in Georgian Bay a dozen or so examples of *D. plexippus* but none at all of *N. antiopa* yet we were at Georgian Bay for a comparable calendar 9 days.

Moths were much more rewarding. We took with us in 1967 a 125 watt 240 volt m.v. lamp together with a transformer to increase the voltage from the local 110 to 240 plus the usual choke used at home. We found some difficulty in persuading the apparatus to work but an engineering friend in Toronto went to much trouble to help us and we were able to use the light. We had no moth trap as such so we made use of a dustbin (garbage-can to Canadians) on which we placed a cardboard carton with a hole in the centre to receive a four flanged baffle which we also made of cardboard. The lamp itself was suspended from a gallows made from two upright pieces of wood passing through the handles of the bin and secured the one to the other about two feet above it. The lamp so suspended just touched the baffle and even the worst storms did not de-range it. This apparatus worked very well and it was left on each night. There were often so many visitors that we were unable to count them and certainly with our then lack of knowledge of the Canadian species it was impossible to record what came. When, early in the evening, the light was running it was surrounded by a cloud of hundreds if not thousands of small insects. Many of those entered the trap together with the moths. We had our problems with birds in the morning and it was necessary to be on the spot early to minimise losses. Birds were not the only such problem since the chipmunks came and disposed of many desirable items in the vegetation around the trap. So friendly were the chipmunks and

so encouraged were they by the free meals so unexpectedly provided for them that they had to be driven away.

This trap we ran in a rising, rocky hollow behind the cottage. There was no long view although the dispersing light could be seen for some distance.

Simultaneously we ran a Heath Portable Trap from a 12 volt accumulator which we purchased in Canada for the purpose, together with a trickle charger. We ran this trap in a number of different situations—in a clearing in a wooded area and also on the lakeshore itself. The results were poor. It is a strange thing that whereas this same trap, with a sheet, produced so much in Jamaica (*Ent. Rec.*, 80, No. 1, January 1968) it attracted no more than a few isolated insects when used in Hong Kong, Kuala Lumpur, Cameron Highlands and in the National Park in Malaysia during two or three hours running in what seemed to us to be ideal situations and conditions. In running this trap we met another enterprising enemy—a frog—which jumped right into the trap itself—a jump of over 12 inches in height.

On our first visit the m.v. light proved most exciting. We took nine species of Sphingids including examples of *Lapara bombycoides* Walk. This sphingid was of particular interest to our friends at the British Museum who had, for some time, been trying to obtain specimens from North America. We were very happy to present them with four. *Bombycoides* is a small Pine Hawk very similar in appearance to our own *Hyloicus pinastri* Linnaeus, though with barely half its wing span.

We also took *Smerinthus jamaicensis* Drury a smaller version of our Eyed Hawk *Smerinthus ocellata* Linnaeus and two other closely related insects. The first, *Calasymbolus exaecata* Abbott and Smith superficially, at any rate, resembles *ocellata* and is about the same size. It has, however, an easily recognisable spot in the centre and towards the leading edge of the forewing. The second was *C. myops mc creary* Clark of which we took five specimens, mostly rather worn, which has the eyes of the hindwings as in *exaecata* (and, of course, *ocellata*) but with no reddish background. We also took three *Ceratonia undulosa borealis* Clark and three splendid examples of *Sphinx kalmiae* Abbott and Smith; one *Daropsa pholus brodiei* Clark; one *Sphinx chersis* Hübn. and four really wonderful *Pachysphinx modesta borealis* Clark. These last mentioned are fully of 5 inches wing span and the reddish and dark brown patches on their hind wings render them particularly beautiful.

In this country the Underwings (Catocalas) are not numerous but in America, North of Mexico, there are said to be about 100 species. These North American insects range from some which are perhaps rather larger than our own Red Underwing (*Catocala nupta* Linnaeus) and with a range of underwing colourings from red, through pink to yellow and white, to others which, with mainly yellow and black markings, are no more than 1½ inches across. The larger Catocalas are truly magnificent as, indeed, is *nupta* but some of the White Underwings are even more striking and especially *C. relictata* Walker of which we took a number.

In all we brought back twelve of the Catocalas (not many out of one hundred) including *C. concumbens* Walker (with pink rather than red underwings); *C. unijuga* Walker; *C. briseis* Edwards and *C. ilea* Cramer. The foregoing all have reddish underwings. In *ilea* the black markings on the red predominate. There were also the two small red underwings

*Ephesia ultrona* Hübner and *E. coccinata* Grote, the first distinguishable from the second by the dark patches on the forewings.

Among those with yellow underwings we took *C. cerogama*, as large as the largest of its red underwinged compatriots and the less spectacular but much more common *C. sordida* Grote and *E. similis* Edwards. Lastly we took *Catabapta antinympha* Hübner with almost black forewings.

In Canada, curiously enough, the "Underwings" are so commonly encountered that we could find no one really interested in them. Nevertheless, with so many such closely related species there must surely be at least a considerable possibility of interesting aberrations.

We have already referred to the similarities of a number of the insects we have mentioned to those known to us in this country. There were other examples. We found a solitary Herald (*Scoliopteryx libatrix* Linnaeus) in the trap and examination in London showed that it was indeed the moth we see so often at home. We also found what we took to be the Swallow Prominent (*Pheosia tremula* Clerck) but on closer examination it was clear that the white wedge shaped streak between veins 1 and 2 was missing and it proved instead to be *P. dimidiata* Herr Schultz. This was not the only member of the Prominents we took. We found *Lophodonta ferruginea* Packard as well, but there are still nearly 100 of this family we have not yet taken.

Another insect which reminded us of our moth trap at Woking was a *Plusia*. It so happened that three weeks before leaving home we had taken a Golden *Plusia* (*Polychrisia moneta* Fabricius ab. *maculata* Lempke) so we were especially interested in *Plusias*. We took a superb enlarged edition of our own Burnished Brass (*Plusia chrysitis* Linnaeus). It was *Plusia balluca* Gever and nearly twice as large. Another comparable moth (comparing country and country) was the Canadian Copper Underwing (*Amphipyra pyramidoides* Quen) so like our own, *A. pyramidea* Linnaeus. We also took *Apatele dactylina* Grote which interested us very much since we live at Woking, one of the not very many places where the Miller (*Apatele leporina* Linnaeus) is taken and we had taken examples this summer. Our *leporina* is much smaller than *dactylina*.

We took other moths, of course, some of them quite impressive. This was especially true of the Imperial Moth (*Citheronia imperialis* Drury). About 4½ inches wing span and with its bipectinate antennae it is certainly regal but by no means difficult to capture. Tiger moths, not unlike our own, exist in Canada. We did take one of the Haploas—*Haploa confusa* Lyman and also the larger Virgo Tiger, *Apantesis virgo* Linnaeus. We only saw one of these but took a number of its relative *A. williamsi* Dodge. These were found in considerable numbers in the trap daily.

Of the other moths we took we should mention *Gonophora rectangulata* Otto, *Nadata gibbosa* Abbott and Smith and *Panthea furcilla* Packard among the many others which, thus far, it has been difficult exactly to identify.

We have already indicated that our 1968 visit to Georgian Bay commenced some 19 days later than our visit in 1967. In this country the 10th August, the commencing date of our visit to Canada in 1968, would not seem unduly late in the season but in Canada we found a great falling off in the numbers of moths which appeared. This had nothing to do with moon conditions, since we timed our trip to coincide with a waning moon. No doubt the severity of the winters, and long winters they are

too, with ice on the Bay well into April. means that most of these insects have had so to arrange their lives that their progeny are able to cope with the extreme conditions to be expected.

However, we felt that 1968 in Georgian Bay had compared, date for date, very poorly with 1967. So we visited the Royal Ontario Museum in Toronto to discuss the matter with someone there likely to know the position. One of us met Mr. M. J. Riote who is in charge of the Entomological Section and talked to him about it. He agreed that for some unexplained reason Georgian Bay had had a disappointing year entomologically. Will it be better next year? No one knows but we propose to go there again—in June rather than later—to see what changes there may be and to be able to add to our records just that much earlier in the year.

Incidentally, Mr. Riote showed us some of the Museum's collection, especially the Sphingids and the Catocalas. This was most interesting and we now have a much better idea of what to expect. In viewing the collection we were intrigued to find that the Museum's current idea of maintaining specimens is to allow them substantially to set in their resting position rather than to set them with wings as is usually the case. In so far as this maintains a record of what the insects may look like when found at rest this may have something to commend it but it did not seem to us to be quite so easy to identify those insects where the principal obvious differences are in their appearance as, for example, in the hindwings which cannot be seen at all. However, no doubt experience is a good teacher and this method does have the merit of saving storage space.

We must return to the ravines of Willowdale, in the suburbs of Toronto for a moment. On several occasions, mid August and early September, we visited one of them and took numbers of the Orange Sulphur or Alfalfa Butterfly (*Colias eurytheme* Boisduval) and the Common or Clouded Sulphur (*Colias philodice* Latreille) as well as the ubiquitous *Pieris rapae* Linnaeus. We met two schoolboys who offered to show us where we could almost certainly take some Mourning Cloaks (Camberwell Beauties in England) *Nymphalis antiopa* Linnaeus. They were right and did so and we must have seen a dozen or so in an afternoon. They were swift on the wing and flew at height but they were greatly attracted by a dead trunk in an almost impossible situation for capture. Nevertheless, we did capture them one at a time on the same spot to which the remainder returned after disturbance. We could find no reason for this since the horizontal tree trunk was quite smooth—having been worn so by climbing children. The same boys guided us to another part of the ravine where they said we could find the Black Swallowtail (*Papilio polyxenes asturias* Stoll). And again they were right. We saw a number but only captured one. Regrettably much of this area has now been bulldozed and is now in the course of development.

In conclusion we wish to refer once again to the Monarch (*Danaus plexippus* Linnaeus). Just before we left Canada in September 1968, we went to see a niece who, with her husband and children, lives near the shore line of Lake Ontario to the south and west of Toronto. On this Sunday morning we saw literally dozens of these magnificent creatures floating over gardens and roads alike. In the days which followed before our departure we saw them wherever we went—even from the public

buses on the main approach roads to Toronto. This was curious since we had seen none at all in this area in 1967 from which we returned to England on 26th August. Had the southward migration started before the 10th September? We could not find out. However, in a year when *plexippus* is found on the south coast of this country in not inconsiderable numbers—and in October—perhaps almost anything can happen.

## Lepidoptera in Lapland

By G. HOWARD

The purpose of these notes is to record some of the Lepidoptera which I have seen in Lapland this year and in so doing perhaps encourage others to visit this vast expanse of moorland, mountain and marsh. In spite of its northerly situation Lapland is fairly easily accessible by road and rail. Unfortunately by virtue of its geographical location, Lapland often seems to get the worst aspects of both maritime and continental types of climate. I have also mentioned a few points of biological interest which are particularly related to Lepidoptera in this area—a tract of country which lies mainly above the Arctic Circle.

In no part of Europe is one so dependent on sunny weather as when collecting Lepidoptera in Lapland. Nearly all who have reported their experiences there have stressed this. The vast majority of day-flying Lepidoptera are only in flight when the sun is shining. Many of them rest when even a thin veil of cloud obscures the sun. One of the exceptions is *Sympistis melaleuca* Thnbg. which I have seen flying in numbers when the sky has been temporarily overcast. The body-temperature of Lepidoptera must reach a certain critical level before flight is possible. It is perhaps surprising that even the relatively slight drop in temperature resulting from thin cloud over the sun, can prevent flight. Both day- and night-flying moths tend to have larger bodies than do butterflies of similar size. They therefore tend to lose heat more slowly than butterflies and this may be one reason why *S. melaleuca* is able to fly during a cloudy spell. Also worth noting in this connection is the fact that *Zygaena exulans vanadis* Dalm. has a lot of hair on its body and this probably results in a decreased rate of heat-loss.

Melanism is some northern species is generally supposed to be an adaptation of low temperatures. *Argynnis improba improbula* Bryk. flies only at a height of about 750-950 metres. The wings, which have a span considerably less than that of other fritillaries occurring in this area, are dark and the wing-pattern appears somewhat blurred. The presence of so much black pigment must result in a relatively rapid uptake of heat. I have seen this butterfly resting on sunny rocks at 900 metres on Nuolja, near Abisko. Before taking flight the wings quiver. This muscular activity causes an increase in body-temperature. One can speculate that similar marked degrees of melanism are not more prevalent in other Lapland fritillaries because interspecific colour differences and patterns must be maintained. At these high latitudes where the density of certain of these species is low, and where the number of sunny hours when flight is possible is limited, it is essential that the males of any species find the females as soon as possible. A further point is that nothing is known of the possible physiological disadvantages which may be associated with